



# “King hit” fatalities in Australia, 2000–2012: The role of alcohol and other drugs



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## ABSTRACT

**Introduction:** “King hits” are when a single blow to the head causes a victim to fall to the ground unconscious, either from the punch itself or the impact between the head and the ground. This can result in fatal skull fractures and subdural hematomas. This study aimed to establish the prevalence of king hit deaths in Australia and determine the involvement of drugs in these violent fatalities.

**Methods:** The National Coronial Information System was used to retrieve all cases involving a king hit within Australia between 2000 and 2012.

**Results:** 90 cases were identified with a median age of 33 years (range 15–78). There were 4 females. Most cases occurred in the state of New South Wales ( $n=28$ ), followed by Victoria and Queensland (24 cases each), at a hotel or pub before 3 a.m. Toxicology reports were available in 68 cases. Of these, 53 cases involved the use of alcohol or other drugs (other than those used in hospital treatment). Forty-nine cases (73%) involved the use of alcohol, with a median alcohol concentration of 0.144 g/100 mL and 0.191 g/100 mL in ante-mortem and post-mortem specimens, respectively. Illicit drugs were detected in 10 cases of which most involved cannabis. Other pharmaceutical drugs were detected in 3 cases.

**Discussion:** Assaults are an ongoing problem in Australia and king hits form a large group of these substance-related and often unprovoked attacks. Importantly, this study indicated that alcohol intoxication increases the risk of victimization, not just aggressive offending. This reiterates the serious consequences of alcohol-fueled violence in Australia.

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## 1. Introduction

Traumatic brain injury (TBI) is characterized by a blow or other force to the head which results in damage to the brain or an alteration in brain function (Australian Institute of Health and Welfare, 2008). A 2008 report by the AIHW indicated that one of the most common causes of this condition is assault, comprising over 3000 cases each year in Australia alone. Many of these result in hospitalization, permanent disability or death (AIHW, 2008).

Recently, the Australian media has reported an alarming incidence of “king hit” assault cases, of which many have been fatal (Flatley, 28 February 2013; Matthews, 22 March 2013; Mullany, 26 April 2013; Rule, 3 January 2013; Russell, 29 November 2012). “King hits” are generally characterized by a single blow to the head, incapacitating a victim causing them to fall to the ground becoming unconscious. This may be either due to the punch itself, or as a result of the impact between the head and the ground. It is

this impact that causes the head to rapidly accelerate and decelerate, sending shock waves through the skull and brain which causes tissue damage, swelling, inflammation and nerve disruption (Hardman and Manoukian, 2002). Consequential skull fractures or subdural hematomas often lead to death, however other injuries (instantaneous or delayed) such as traumatic basal subarachnoid hemorrhage can also be fatal (Hardman and Manoukian, 2002; Shaw, 2002).

A number of studies have demonstrated a link between substance misuse and homicides (Albrektsen et al., 1989; Darke et al., 2009; Escobedo and Ortiz, 2002; Shaw et al., 2006). Alcohol is often the primary substance to blame, particularly in cases of street violence, due to its ability to diminish the control of emotions in users, such as aggression (Darke, 2009). Psychostimulants, such as methamphetamine and cocaine, are also known to cause aggressive behavior (Licata et al., 1993; Miczek and Tidey, 1989; Pluddemann et al., 2010; Yudofsky et al., 1993). Perhaps more importantly in the context of assault, they are known to be cardiotoxic with repeated use, with chronic users showing a higher incidence of ventricular hypertrophy and sudden cardiac arrhythmia, regardless of age (Pilgrim et al., 2009, 2013). Accordingly, there may be an increased risk of sudden death in king hit victims using psychostimulant

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drugs, particularly in the case of commotio cordis; an often lethal disruption of the heart rhythm that occurs as a result of a blow to the area directly over the heart (Lucena et al., 2008).

The literature to date examining drugs in single hit assaults is scarce. Although there is evidence of the association between traumatic basal subarachnoid hemorrhage and alcohol intoxication, most research focuses on multiple injury assaults (Dowling and Curry, 1988; Ruiz-Sandoval et al., 1999). A recent study examined the toxicology of violent deaths (homicides vs. suicides) in New South Wales, Australia (Darke et al., 2009). This study found that homicides were significantly more likely than suicides to have illicit drugs detected and significantly less likely to have antidepressants, antipsychotics or benzodiazepines detected. Interestingly, there was no significant difference in the prevalence of alcohol in either group.

Epidemiological literature suggests that research and intervention can make an impact upon substance-related assaults. Data shows that increases and declines in violent crimes are consistent with trends in the use of alcohol and drugs such as cocaine (Darke, 2009). An opportunity for death prevention may be revealed if the involvement of drugs in these violent deaths is found to be more contributory than previously thought. This study aimed to ascertain the prevalence of deaths in Australia involving “king hits” and determine the involvement of drugs and other sociological factors in these violent fatalities.

## 2. Methods

### 2.1. Case identification

The National Coronial Information System (NCIS) database was used to retrieve all coroners' cases from Australia between January 2000 and December 2012 involving deaths following a king hit. Only cases that were no longer under investigation by the coroner (“closed cases”) were included.

Cases were identified by performing a detailed search of the NCIS for all assault cases with the ‘object’ of death coded as ‘a person’ or ‘persons’ (cases are coded prospectively in each state by coroners' clerks). This list was then refined by excluding any cases coded as multiple blows. Coronial reports (autopsy or police report, coronial findings) were then examined on an individual case basis to establish the circumstances surrounding the death and to determine whether a king hit was contributory to the death.

A “king hit” death was defined as any instance where a single blow to the head, neck or chest, incapacitated an individual, causing them to fall to the ground becoming unconscious; either as a result of the punch itself, or as a result of the impact between the head and the ground.

Cases were excluded if the individual was found deceased without evidence to suggest details of the assault, or if coronial findings and police reports were not accessible on the NCIS, limiting the detail available regarding the assault.

Although cases up until the end of 2012 were included, it must be noted that only a small percentage of cases from recent years (5% closed in 2013; 50% in 2012; 80% in 2011) were closed by the coroner and thus searchable on the NCIS. It is likely that other cases of fatal king hits occurred in the study period but were not accessible for this project as they were still under investigation by the Coroner and/or the criminal courts in Australia.

### 2.2. Death investigation

Data extracted on each case included demographic information (e.g., age, gender), autopsy findings (e.g., cause of death and any co-morbidities), toxicology findings, information from medical

records where present (e.g., if individual died in hospital following assault) and police reports and coronial findings describing the circumstances of the death. These cases had been referred to the respective state coroners for a medico-legal death investigation due to the perceived unexpected or suspicious nature of the death. All such cases undergo a forensic autopsy which includes histology and full quantitative toxicology for most commonly used drugs. The cause of death is determined by the forensic pathologist based on the case circumstances and the results of the medico-legal death investigation. The coroner is responsible for reporting all findings including the manner of death and any relevant recommendations for prevention.

Toxicological analysis is preferentially performed using femoral blood when blood is collected post-mortem. When hospitalization occurs, ante-mortem samples are sourced. Drugs administered by hospital staff were excluded. Routine toxicological analysis includes analytical screening for prescription, over-the-counter and common drugs of abuse in biological specimens, using various techniques.

### 2.3. Data analysis

A detailed analysis of the cohort was undertaken to determine the following:

- The circumstances of death, including the location of the incident, how many people were involved and any relevant information from witness reports from the assault/incident;
- Basic characteristics of the cohort including the prevalence of deaths in each state, the age and sex of victims;
- The toxicology results for each case including the most commonly implicated drugs (including alcohol) and their possible contribution to the death and;
- The autopsy findings relevant to the death, including head/chest injuries and CT scan results.

### 2.4. Ethical review

This research study was approved by the Victorian Institute of Forensic Medicine Research Advisory committee and the Department of Justice Human Research Ethics Committee.

## 3. Results

### 3.1. Characteristics of cohort

There were 90 cases identified between January 2000 and December 2012 involving a fatal king hit, with a median age of 33 years (range 15–78). There were 4 females. Most cases occurred in the state of New South Wales ( $n=28$ ), followed by Victoria and Queensland (24 cases each). These figures were roughly in accordance with population distribution throughout Australia. The NCIS Unit advised that there are at least two cases that are open on the NCIS where there is reference to a death after a person was “king hit”.

Two cases (Cases 30 and 36) involved 2 consecutive, rapid, punches, and an additional 2 cases (Cases 4 and 42) involved 3 consecutive punches, with the final blow described as a “king hit” causing the victim to become unconscious. All other deaths involved single-punches.

The most common cause of death in the cohort was head or facial injury, followed by intracranial hemorrhage, and head or brain trauma, respectively (Table 1). Alcohol intoxication was also listed as a contributor to death in 10% of the cohort, with these

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